PATENT SPECIFICATION (11) 1 498 891

1 498 891

(21) Application No. 2551/75 (22) Filed 21 Jan. 1975 (19)
(31) Convention Application No. 435 800 (32) Filed 23 Jan. 1974 in
(33) United States of America (US)
(44) Complete Specification published 25 Jan. 1978
(51) INT. CL.² F16B 2/20
(52) Index at acceptance
E2B 4B8U
F2S 6E3

(54) SNAP-IN MOUNTING AND MOUNTING ASSEMBLY

(71) We, LORD CORPORATION, a Corporation organised and existing under the laws of the state of Pennsylvania, U.S.A., located at 1635 West 12th Street, Erie, state of Pennsylvania, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a snap-in mounting.

In industry, there are many instances where it is necessary to resiliently mount one body relative to another so as to provide vibration and/or shock isolation therebetween. Such mountings require means of interconnection to the respective bodies with the resilient means remaining free to resiliently accommodate at least some relative movement.

It is an object of the present invention to provide a snap-in mounting which can be installed and/or removed relative to a support without the need for additional parts and/or tools.

It is another object of the present invention to provide a snap-in mounting wherein the interconnection with the support contributes to the isolation properties of the mounting.

According to the present invention there is provided a snap-in mounting for snap engagement with a support bracket for the mounting, said mounting comprising an inner rigid sleeve to embrace and mount a member to be supported, an outer sleeve concentric with and spaced about said inner sleeve, resilient material interposed and secured between said sleeves to accommodate limited relative movement of said sleeves, in use, a first flange extending radially outward from said outer sleeve adjacent one end thereof for engagement, in use, with one face of said support bracket, a second flange extending outward from said outer sleeve in opposed co-axial relation to said first flange and resiliently connected to said outer sleeve adjacent the other end of the outer sleeve to be urged toward said first flange for gripping said support bracket between said flanges to secure in position the mounting and supported member carried by the mounting, in use.

In order that it may be clearly understood and readily carried into effect, the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a top plan view of a mounting of the present invention;

Figure 2 is a sectional view taken substantially along the line 2—2 of Figure 1;

Figure 3 is a top plan view of a mounting assembly employing the mounting of Figure 2;

Figure 4 is a sectional view taken substantially along the line 4—4 of Figure 3;

Figure 5 is a sectional view of another mounting of the present invention; and

Figure 6 is a sectional view of a mounting assembly employing the mounting of Figure 5.

In Figures 1 and 2 there is shown a snap-in mounting, generally indicated at 10, of the present invention. As illustrated, the mounting 10 comprises concentrically spaced inner and outer rigid cylindrical sleeves 11 and 12 subject to both relative axial and radial movement. The inner rigid sleeve 11 extends beyond opposite ends of the outer rigid sleeve 12.

A resilient elastomeric annular member 13 is interposed and secured by bonding between the sleeves 11 and 12. The elastomeric member 13 resiliently accommodates relative movement between the sleeves 11 and 12. The spring rates between the sleeves 11 and 12 can be controlled by the design of the elastomeric member 13, particularly by its length and thickness.

A first, fixed flange 14 is carried by and adjacent one end of the outer sleeve 12. The flange 14 is continuous circumferentially of outer sleeve 12 and extends radially outward from the outer sleeve 12. The flange 14 may be formed integrally with the outer sleeve 12 or separately, as shown. When formed separately, it must be fixedly attached to the outer sleeve 12. It is desirable that the flange 14 include a chamfered edge 14a on the under-

side thereof facing in the direction of the other end of the outer sleeve 12. The fixed flange 14 should be formed of a rigid wear resistant material such as nylon, of low coefficient of friction.

A second flange comprising an annular locking ring 15, formed of wear resistant material having a low coefficient of friction and carried by an elastomeric annulus 16, is concentrically disposed about the outer sleeve 12 in axially spaced relation to the flange 14. The spacing of the locking ring 15 from the flange 14 should be less than the thickness of a support bracket with which the mounting 10 is to be used. Also, the locking ring 15 is disposed in circumferentially spaced relation to the outer sleeve 12 to allow radial movement of the outer sleeve 12 relative to the locking ring 15. The locking ring 15 includes a plurality of circumferentially spaced projections 15a extending axially toward and in opposed relation to fixed flange 14. The locking ring 15 is resiliently interconnected to the other end of the outer sleeve 12 by an annular elastomeric member 16 having an L-shaped cross section. The end of one of the legs of the elastomeric member 16 is secured, bonded, to the outer sleeve 12 while the end of the other leg is bonded to the ring 15. This elastomeric member 16, thus, normally maintains the ring 15 in a predetermined position as shown relative to flange 14 and resiliently resists relative movement between the flange 14 and ring 15. It will also be noted that the ring 15 may move resiliently relative to the inner and outer sleeves 11 and 12.

With reference to Figures 3 and 4, there is shown a mounting assembly employing a mounting 10 for resiliently mounting a rotatable textile spindle 20 on a support bracket 21. As illustrated, the spindle 20 is fixedly mounted within inner sleeve 11 by way of a mounting sleeve 22 having an integral seating collar 23 engaging the upper end of inner sleeve 11. A washer 24 is located at the other end of sleeve 22. The lower end of inner sleeve 11 seats on the washer and is held there by a nut 25. The extension of inner sleeve 11 beyond outer sleeve 12 eliminates interference of the collar 23 and washer 25 with the other functional parts of the mounting 10.

With the spindle 20 secured within the mounting 10, the mounting can be assembled with the support bracket 21. The support bracket 21 is generally U-shaped to define an opening for receiving the mounting 10. The thickness of the bracket should be greater than the normal axial spacing between the flange 14 and locking ring 15. Also, the opening should be wider than the external diameter of outer sleeve 12. Further, circumferentially spaced recesses or apertures 21a should be provided in the bracket 21 to coincide with the projections 15a of the ring 15 when the mounting 10 is fully received between the bracket legs. To install the mounting 10 on the bracket, the mounting 10 is aligned with the bracket legs and the bracket legs wedged between the fixed flange 14 and ring 15. The chamfered edge 14a on the flange 14 and low coefficient of friction of flange 14 and ring 15 facilitates initiation of this wedging action. The elastomeric member 16 will allow the ring 15 to move axially away from flange 14 to receive therebetween the legs of the bracket 21. The mounting 10 is adjusted until the ring projections 15a and bracket recesses 21a interlock. It will be apparent that the mounting 10 can readily be removed by overcoming the resilient force of elastomeric member 16. It will also be apparent that the projections for interlocking could equally well be provided on the flange 14. The resiliently mounted ring 15 would still provide the positive interlock with the support bracket 21.

To prevent release of the mounting 10 from the support bracket 21 during operation, the relative axially spring rates of the elastomeric members 13 and 16 should be such that relative axial motion is predominately accommodated by elastomeric member 13. The elatomeric member 16 should only accommodate a very limited amount of axial motion. Radial motion of the outer sleeve 12 may be resiliently accommodated by elastomeric member 16 while flange 14 slides relative to the support bracket 21.

There is shown in Figure 5 a modified snap-in mounting, generally indicated at 30, of the present invention. The mounting 30 is substantially identical to mounting 10 except that the first flange 14 has been modified to take on a form analogous to the second flange of Figures 1 and 2. In particular, the mounting 30 includes concentrically spaced inner and outer rigid cylindrical sleeves 31 and 32 with an elastomeric annular member 33 interposed and bonded between the sleeves 31 and 32. As with the mounting 10, the inner sleeve 31 extends beyond opposite ends of outer sleeve 32. The elastomeric member 33 resiliently accommodates relative movement, both axially and radially, between the sleeves 31 and 32. First and second flanges comprise axially spaced locking rings 34 and 35 respectively, which are concentrically disposed about the outer sleeve 32 in circumferentially spaced relation thereto. The locking rings 34 and 35 are resiliently interconnected to opposite ends of the outer sleeve 32. This resilient interconnection is provided by annular elastomeric members 36 and 37 having an L-shaped cross section. The ends of the legs of the elastomeric members 36 and 37 are bonded between the locking rings 34 and 35, respectively, and opposite ends of the less outer sleeve 32. This resilient interconnection normally maintains the locking rings 34 and 35 in a predetermined axially spaced relation

and resiliently resists movement thereof axially and radially relative to the outer sleeve 32. Both of the locking rings 34 and 35 include a plurality of circumferentially spaced projections 34a and 35a, respectively, extending axially of the mounting 30 toward opposed locking rings 34 and 35. In the present illustration, the projections 34a and 35a are axially aligned relative to each other.

With reference to Figure 6, there is shown a mounting assembly wherein a mounting 30 is utilized to support a spindle 20 relative to a support bracket 21. The spindle 20 and support bracket 21 are identical to that shown in Figure 4 and accordingly will not be described again. Identical reference characters are employed. The mounting 30 is installed on the support bracket 21 in a manner identical to that for mounting 10. However, as will be apparent in Figure 6, positive interlocking is provided on both sides of the support bracket 21 by the locking rings 34 and 35. Further, the outer sleeve 32 is resiliently connected by both the locking rings 34 and 35 to the support bracket 21. Accordingly, shock and/or vibration may be accommodated in the mounting through both the elastomeric member 33 interposed between the inner and outer rigid sleeves 31 and 32 and by the elastomeric members 36 and 37 which resiliently mount the locking rings 34 and 35 relative to the outer sleeve 32.

The mountings 10 and 30 have been illustrated for mounting a spindle relative to a support bracket. With the snap-in features of the mountings 10 and 30, the spindle may be permanently secured to the mounting and the combined mounting and spindle easily installed and/or removed from a support bracket. This will facilitate movement of the spindle between various spinning stations, as has become a common practice in the textile industry while providing vibration and/or shock isolation therefor.

More generally, it will be recognized that there has been provided by the present invention a mounting which can be installed and/or removed without the need for additional parts and/or tools with a minimum of time and labor and wherein the interconnection of the mounting with the support structure may provide shock and/or vibration isolation.

WHAT WE CLAIM IS:—

1. A snap-in mounting for snap engagement with a support bracket for the mounting, said mounting comprising an inner rigid sleeve to embrace and mount a member to be supported, an outer sleeve concentric with and spaced about said inner sleeve, resilient material interposed and secured between said sleeves to accommodate limited relative movement of said sleeves, in use, a first flange extending radially outward from siad outer sleeve adjacent one end thereof for engagement, in use, with one face of said support bracket, a second flange extending outward from said outer sleeve in opposed co-axial relation to said first flange and resiliently connected to said outer sleeve adjacent the other end of the outer sleeve to be urged toward said first flange for gripping said support bracket between said flanges to secure in position the mounting and supported member carried by the mounting, in use.

2. A mounting as claimed in Claim 1, wherein the inner sleeve extends beyond the ends of the outer sleeve.

3. A mounting as claimed in either of the preceding claims, wherein said second flange comprises a locking ring disposed in circumferentially spaced relation to said outer sleeve.

4. A mounting as claimed in claim 3, wherein the locking ring includes a plurality of circumferentially spaced projections extending toward said first flange for engagement, in use, with recesses in said support bracket.

5. A mounting as claimed in any one of the preceding claims, wherein an outer edge of said first flange adjacent the second flange is chamfered.

6. A mounting as claimed in any one of Claims 3 to 5 wherein said second flange is connected to said outer sleeve by an elastomeric annulus having an L-shaped cross-section with an annular portion, co-axial with and bonded at its inner face to said outer sleeve, and a further annular portion, extending in radially spaced relation about said outer sleeve and bonded at its free end to said locking ring of the second flange.

7. A mounting as claimed in any one of the preceding claims, wherein the first flange is fixed relative to the outer sleeve.

8. A mounting as claimed in any one of Claims 3 to 6, wherein said first flange is connected to said outer sleeve by an elastomeric annulus having an L-shape in cross-section, with an annular portion, co-axial with and bonded at its inner face to said outer sleeve adjacent an outer end thereof to project outwardly of the outer sleeve and a further annular portion extending in radially spaced relation about said outer sleeve towards the other end of the sleeve and bonded at its free end to a locking ring which is in opposed relationship to the locking ring carried by the second flange.

9. The snap-in mounting substantially as hereinbefore described with reference to and

as shown in Figures 1 to 4 of the accompanying drawings.

10. The snap-in mounting substantially as hereinbefore described with reference to and as shown in Figures 5 and 6 of the accompanying drawings.

MARKS & CLERK,
Alpha Tower,
ATV Centre,
Birmingham B1 1TT,
Agents for the Applicants,

Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1978.
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY
from which copies may be obtained.

1498891 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

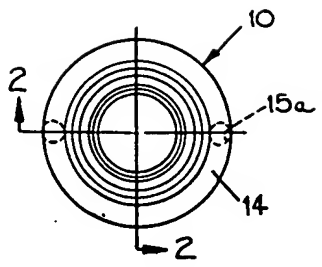

FIG. 1

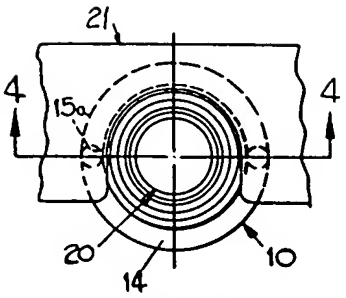

FIG. 3

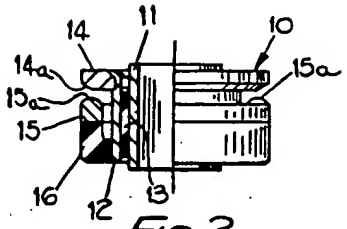

FIG. 2

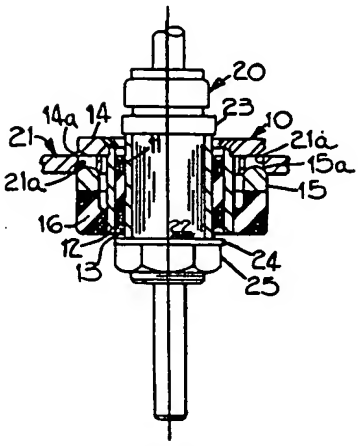

FIG. 4

1498891 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 2

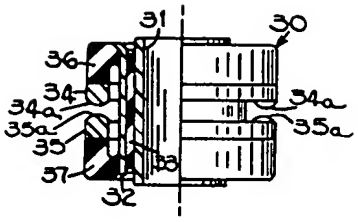

FIG. 5

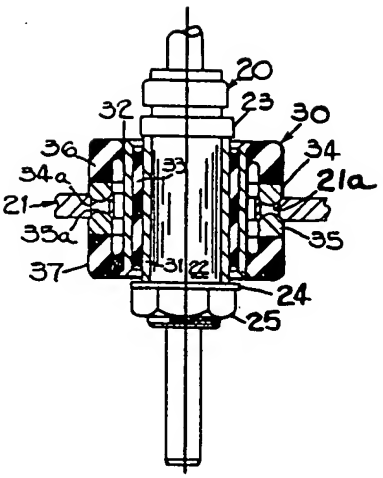

FIG. 6